

Listing of the Claims:

This listing of claims will replace all previous versions of the claims:

1. (Currently Amended) A giant magnetoresistive element comprising:
 - a first antiferromagnetic layer;
 - a pinned magnetic layer formed on the first antiferromagnetic layer such that a magnetization direction is pinned by an exchange coupling magnetic field with the first antiferromagnetic layer;
 - a nonmagnetic material layer formed on the pinned magnetic layer;
 - a free magnetic layer formed on the nonmagnetic material layer such that a magnetization direction of a central portion changes with an external magnetic field;
 - nonmagnetic layers formed on both side portions of the free magnetic layer in a track width direction;
 - ferromagnetic layers formed on the respective nonmagnetic layers; and
 - second antiferromagnetic layers formed on the respective ferromagnetic layers to align a magnetization direction of each ferromagnetic layer in a direction perpendicular to the magnetization direction of the pinned magnetic layer;wherein at least the free magnetic layer, the nonmagnetic layers and the ferromagnetic layers have continuous end surfaces at both sides in the track width direction, and
electrode layers are formed in contact with upper surfaces of the respective second antiferromagnetic layers and contact with end surfaces of the layers ranging from the antiferromagnetic layers to the pinned magnetic layer at both sides in the track width direction.
2. (Previously Presented) A giant magnetoresistive element according to claim 1, wherein a ratio (FW/FL) of a dimension FW of the free magnetic layer to a dimension FL of the ferromagnetic layers in the track width direction is 1.1 to 2.0.
- 3-4. (Cancelled)

5. (Withdrawn) A giant magnetoresistive element according to claim 1, wherein each of the second antiferromagnetic layers comprises a lower antiferromagnetic layer laminated on each ferromagnetic layer, and an upper antiferromagnetic layer, each of the lower antiferromagnetic layers having a thickness of 20 Å to 50 Å.

6. (Withdrawn) A giant magnetoresistive element according to claim 5, wherein a total thickness of each lower antiferromagnetic layer and upper antiferromagnetic layer is 80 Å to 300 Å.

7. (Withdrawn) A giant magnetoresistive element according to claim 5, further comprising nonmagnetic protective layers interposed between the lower antiferromagnetic and upper antiferromagnetic layers, each of the nonmagnetic protective layers having a thickness of 3 Å or less.

8. (Withdrawn) A giant magnetoresistive element according to claim 7, wherein a constituent element of the nonmagnetic protective layers is mixed in the upper or lower antiferromagnetic layers.

9. (Withdrawn – Amended) A giant magnetoresistive element according to claim 7, wherein a constituent element of the nonmagnetic protective layers is at least one of Ru, Rh, Pd, Ir, Os, Re, Cr, Cu, Pt, and or Au.

10. (Currently Amended) A giant magnetoresistive element according to claim 1, wherein each of the free magnetic layer and the ferromagnetic layers comprises any at least one of a NiFe alloy, Co, a CoFe alloy, a CoNi alloy, or a CoFeNi alloy.

11. (Previously Presented) A giant magnetoresistive element according to claim 1, wherein the free magnetic layer and ferromagnetic layers are made of the same magnetic material, and a thickness of the ferromagnetic layers is smaller than that of the free magnetic layer.

12. (Previously Presented) A giant magnetoresistive element according to claim 1, wherein each of the free magnetic layer and ferromagnetic layers comprises a single

layer, and at least one of the free magnetic layer or ferromagnetic layers comprise a CoFeNi alloy.

13. (Original) A giant magnetoresistive element according to claim 1, wherein the free magnetic layer comprises a laminate of a NiFe alloy layer and a CoFe alloy layer, and each of the ferromagnetic layers comprises a laminate of a CoFe alloy layer and a NiFe alloy layer.

14. (Currently Amended) A giant magnetoresistive element according to claim 1, wherein each of the nonmagnetic layers is composed of at least one of Ru, Rh, Pd, Ir, Os, Re, Cr, Cu, Pt, and or Au.

15. (Currently Amended) A giant magnetoresistive element according to claim 1, wherein each of at least one of the first antiferromagnetic or second antiferromagnetic layers comprises at least one of a PtMn alloy, a X-Mn (wherein X is at least one element of Pd, Ir, Rh, Ru, Os, Ni, and Fe) alloy, or a Pt-Mn-X' (wherein X' is at least one element of Pd, Ir, Rh, Ru, Au, Ag, Os, Cr, Ni, Ar, Ne, Xe, and Kr) alloy.

16. (New) A giant magnetoresistive element comprising:

- a first antiferromagnetic layer;
- a pinned magnetic layer formed on the first antiferromagnetic layer such that a magnetization direction is pinned by an exchange coupling magnetic field with the first antiferromagnetic layer;
- a nonmagnetic material layer formed on the pinned magnetic layer;
- a free magnetic layer formed on the nonmagnetic material layer such that a magnetization direction of a central portion changes with an external magnetic field;
- nonmagnetic layers formed on both side portions of the free magnetic layer in a track width direction;
- ferromagnetic layers formed on the respective nonmagnetic layers; and
- second antiferromagnetic layers formed on the respective ferromagnetic layers to align a magnetization direction of each ferromagnetic layer in a direction perpendicular to the magnetization direction of the pinned magnetic layer;

wherein at least the free magnetic layer, the nonmagnetic layers and the ferromagnetic layers have continuous end surfaces at both sides in the track width direction,

electrode layers are formed in contact with upper surfaces of the respective second antiferromagnetic layers and contact with end surfaces of the layers ranging from the antiferromagnetic layers to the pinned magnetic layer at both sides in the track width direction, and

each of the electrode layers comprises a first electrode layer formed in contact with the end surfaces of the layers ranging from the pinned magnetic layer to each second antiferromagnetic layer at each side in the track width direction, and a second electrode layer formed on the first electrode layer and each second antiferromagnetic layer.

17. (New) A giant magnetoresistive element according to claim 16, wherein a ratio (FW/FL) of a dimension FW of the free magnetic layer to a dimension FL of the ferromagnetic layers in the track width direction is 1.1 to 2.0.

18. (New) A giant magnetoresistive element according to claim 16, wherein each of the second antiferromagnetic layers comprises a lower antiferromagnetic layer laminated on each ferromagnetic layer, and an upper antiferromagnetic layer, each of the lower antiferromagnetic layers having a thickness of 20 Å to 50 Å.

19. (New) A giant magnetoresistive element according to claim 18, wherein a total thickness of each lower antiferromagnetic layer and upper antiferromagnetic layer is 80 Å to 300 Å.

20. (New) A giant magnetoresistive element according to claim 18, further comprising nonmagnetic protective layers interposed between the lower antiferromagnetic and upper antiferromagnetic layers, each of the nonmagnetic protective layers having a thickness of 3 Å or less.

21. (New) A giant magnetoresistive element according to claim 20, wherein a constituent element of the nonmagnetic protective layers is mixed in the upper or lower antiferromagnetic layers.

22. (New) A giant magnetoresistive element according to claim 20, wherein a constituent element of the nonmagnetic protective layers is at least one of Ru, Rh, Pd, Ir, Os, Re, Cr, Cu, Pt, or Au.

23. (New) A giant magnetoresistive element according to claim 16, wherein each of the free magnetic layer and the ferromagnetic layers comprises at least one of a NiFe alloy, Co, a CoFe alloy, a CoNi alloy, or a CoFeNi alloy.

24. (New) A giant magnetoresistive element according to claim 16, wherein the free magnetic layer and ferromagnetic layers are made of the same magnetic material, and a thickness of the ferromagnetic layers is smaller than that of the free magnetic layer.

25. (New) A giant magnetoresistive element according to claim 16, wherein each of the free magnetic layer and ferromagnetic layers comprises a single layer, and at least one of the free magnetic layer or ferromagnetic layers comprise a CoFeNi alloy.

26. (New) A giant magnetoresistive element according to claim 16, wherein the free magnetic layer comprises a laminate of a NiFe alloy layer and a CoFe alloy layer, and each of the ferromagnetic layers comprises a laminate of a CoFe alloy layer and a NiFe alloy layer.

27. (New) A giant magnetoresistive element according to claim 16, wherein each of the nonmagnetic layers is composed of at least one of Ru, Rh, Pd, Ir, Os, Re, Cr, Cu, Pt, or Au.

28. (New) A giant magnetoresistive element according to claim 16, wherein each of at least one of the first antiferromagnetic or second antiferromagnetic layers comprises at least one of a PtMn alloy, a X-Mn (wherein X is at least one element of Pd, Ir, Rh, Ru, Os, Ni, and Fe) alloy, or a Pt-Mn-X' (wherein X' is at least one element of Pd, Ir, Rh, Ru, Au, Ag, Os, Cr, Ni, Ar, Ne, Xe, and Kr) alloy.